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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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11/14/2001

Yu-Ling Chen

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10/18/2004

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EXAMINER

BARAN, MARY C

ART UNIT

PAPER NUMBER

2857

DATE MAILED: 10/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/987,230	Applicant(s) CHEN, YU-LING	
	Examiner Mary Kate B Baran	Art Unit 2857	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 July 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-74 and 78 is/are pending in the application.
- 4a) Of the above claim(s) 46-74 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7-11, 15-19, 22-26, 30-34, 37-41 and 45 is/are rejected.
- 7) ☒ Claim(s) 5, 6, 12-14, 20, 21, 27-29, 35, 36, 42-44 and 78 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>02 March 2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This action is responsive to the amendments filed 22 July 2004. Claims 1-74 and 78 are pending. Claims 1-3, 5-8, 10-23, 25-33, 35-38 and 40-45 have been amended. Claims 75-77 have been cancelled. Claim 78 is new.
2. The amendments filed 22 July 2004 are sufficient to overcome the prior objections to the specification.

Information Disclosure Statement

3. The information disclosure statement (IDS) submitted on 02 March 2004 was received. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 7, 8, 10, 11, 15-19, 22, 23, 25, 26, 30-34, 37, 38, 40, 41 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zandi et al. (U.S. Patent

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No. 6,195,465) (hereinafter Zandi) in view of Joshi et al. (U.S. Patent No. 6,668,090) (hereinafter Joshi).

Referring to claims 1, 16 and 31, Zandi teaches entropy coding of discrete wavelet transform (DWT) coefficient bits that are arranged in code blocks (see Zandi, column 7 lines 15-23) and coded in bitplane order (see Zandi, column 19 lines 32-50), said method including the steps of: pre-analyzing transform coefficients of a code block (see Zandi, Figure 1) in sign-magnitude form (see Zandi, column 7 lines 24-34) to determine statistical data about the coefficients (see Zandi, column 27 lines 35-50); storing the statistical data (see Zandi, column 27 lines 37-38); and generating, based upon the statistical data (see Zandi, column 27 lines 41-45), at least one command for at least one sequence for arithmetic encoding (see Zandi, column 27 lines 37-39), wherein a sequence comprises a plurality of bit and context pairs (see Zandi, column 5 lines 22-25). Zandi does not teach coding using three coding passes for each bitplane.

Joshi teaches coding using three coding passes for each bitplane (see Joshi, column 6 lines 45-49).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Zandi to include the teachings of Joshi because using a three pass system would have allowed the skilled artisan to achieve the corresponding visual significance value (see Joshi, column 2 lines 60-63).

Referring to claims 2, 17 and 32, Zandi teaches that said statistical data is stored with the coefficients (see Zandi, column 27 lines 11-19).

Referring to claims 3, 18 and 33, Zandi teaches buffering significance state data, coded data, magnitude refinement data, bit data, and sign data for the code block (see Zandi, column 29 lines 34-36 and column 28 lines 46-49).

Referring to claims 4, 19 and 34, Zandi teaches that said buffering step is implemented using register arrays for context generation (see Zandi, column 9 lines 38-43 and column 35 lines 14-19).

Referring to claims 7, 22 and 37, Zandi teaches buffering bit and context data before arithmetic coding using the bit and context data. (see Zandi, column 34 lines 37-42)

Referring to claims 8, 23 and 38, Zandi teaches that bit, context and the number of bit and context pairs are buffered (see Zandi, column 28 lines 46-49).

Referring to claims 10, 25 and 40, Zandi teaches that buffering a region of a code block, the region being currently coded (see Zandi, column 29 lines 34-36); and buffering separately the remaining regions of the code block (see Zandi, column 29 lines 36-42).

Referring to claims 11, 26 and 41, Zandi teaches that said buffering step for the region currently being coded is implemented using a register window (see Zandi, column 37 lines 19-33); and the buffering step for said remaining regions is implemented using a scratch memory (see Zandi, column 37 lines 52-56).

Referring to claims 15, 30 and 45, Zandi teaches all the features of the claimed invention except that the entropy coding is JPEG 2000 entropy coding.

Joshi teaches that the entropy coding is JPEG 2000 entropy coding (see Joshi, column 4 lines 37-40).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Zandi to include the teachings of Joshi because JPEG 2000 entropy coding would have allowed the skilled artisan flexibility in terms of organization and ordering of the compressed bit-stream (see Joshi, column 1 lines 50-62).

5. Claims 9, 24 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zandi et al. (U.S. Patent No. 6,195,465) (hereinafter Zandi) in view of Joshi et al. (U.S. Patent No. 6,668,090) (hereinafter Joshi) and further in view of Schwartz (U.S. Patent No. 6,229,927).

Referring to claims 9, 24 and 39, Zandi and Joshi teach all the features of the claimed invention except that said buffering computer program code means implements a FIFO.

Schwartz teaches that said buffering computer program code means implements a FIFO (see Schwartz, column 29 lines 42-54).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Zandi and Joshi to include the teachings of Schwartz because using a FIFO would have allowed the skilled artisan to reduce any data loss when sending data to the arithmetic coder.

Allowable Subject Matter

6. Claims 5, 6, 12-14, 20, 21, 27-29, 35, 36, 42-44 and 78 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

7. Applicant's arguments filed 22 July 2004 have been fully considered but they are not persuasive.

Applicant argues that Zandi does not teach "pre-analyzing transform coefficients of a code block in sign-magnitude form to determine statistical data about the coefficients". However, Applicant's arguments are not well taken, as Zandi does teach pre-analyzing transform coefficients of a code block (see Zandi, Figure 1) in sign-magnitude form (see Zandi, column 7 lines 24-34) to determine statistical data about the coefficients (see Zandi, column 27 lines 35-50). Zandi depicts in Figure 1, analyzing

transform coefficients (i.e. "Reversible Wavelets 102" and "Coefficient Data Ordering and Modeling 103") prior to the data entering the entropy coder (i.e. "Entropy Coder 104"). The data input to the "Coefficient Data Ordering and Modeling 103" block places the data in sign/magnitude format (see Zandi, column 7 lines 12-34 and Figure 2), this data is then sent to encoder (see Zandi, Figure 2). Zandi's encoder does use statistical data when encoding the bits (see Zandi, column 27 lines 35-50). Zandi does teach that the statistical data is generated prior to encoding (see Zandi, column 27 lines 41-45). While statistical data is being generated during the encoding, the statistics generated are being used to code the following or later coded units (see Zandi, column 27 lines 41-45); therefore, Zandi meets the limitations which recites, "pre-analyzing transform coefficients of a code block (see Zandi, Figure 1) in sign-magnitude form (see Zandi, column 7 lines 24-34) to determine statistical data about the coefficients (see Zandi, column 27 lines 35-50)."

Applicant further argues that Zandi does not teach "generating, based upon the statistical data, at least one command for at least one sequence for arithmetic encoding, wherein a sequence comprises a plurality of bit and context pairs." However, this is not the case, as Zandi does teach generating a command for encoding (see Zandi, column 27 lines 37-39) based on statistical data (see Zandi, column 27 lines 41-45). This statistical data, as explained above, is generated prior to the coding of the current coding unit (see Zandi, column 27 lines 41-45), and does include a plurality of bit and context pairs, as the data sent to the encoder includes context modeling (see Zandi, column 5 lines 22-25) which is context and probability data relating to the current bit.

Therefore, Zandi teaches generating, based upon the statistical data (see Zandi, column 27 lines 41-45), at least one command for at least one sequence for arithmetic encoding (see Zandi, column 27 lines 37-39), wherein a sequence comprises a plurality of bit and context pairs (see Zandi, column 5 lines 22-25).

Applicant further argues that Zandi does not teach an arithmetic encoder that can generate a code word for the sequence in a single clock cycle; however, this language is not specified the claims.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mary Kate B Baran whose telephone number is (571)


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272-2211. The examiner can normally be reached on Monday - Friday from 9:00 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc S Hoff can be reached on (571) 272-2216. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

07 October 2004



DONALD E. McELHENY, JR.
PRIMARY EXAMINER